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प्लास्टिक – परीक्षण पद्धतियाँ

भाग 11 विशिष्ट गुणधर्म

अनुभाग 4 प्लास्टिक पटल की जेल गणना ज्ञात करना

Indian Standard

PLASTICS — METHODS OF TESTING

PART 11 SPECIAL PROPERTIES

Section 4 Determination of Gel Count of Plastics Film

ICS 83.140.10; 19

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Methods of Test for Plastics Sectional Committee, PCD 23

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Methods of Test for Plastics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

The presence of gels in plastics film is often objectionable due to appearance and to the problem associated with printing the film. The test method calls for magnifying the specimen by 8 to 10 times thus making the gels easier to see. At the same time, standard-size images are projected on the screen at the same magnification. The method prescribed in this standard is designed to allow gels to be counted that would normally be difficult to observe with the unaided eye.

While preparing this standard considerable assistance has been derived from ASTM D 3351-93 'Standard test method for gel count of plastic film' issued by American Society for Testing and Materials, USA.

In reporting the results of a test of analysis in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

PLASTICS — METHODS OF TESTING

PART 11 SPECIAL PROPERTIES

Section 4 Determination of Gel Count of Plastics Film

1 SCOPE

1.1 This Indian Standard covers the determination of the number of gels present in plastic film when observing the images formed on a screen when light is projected through the film.

1.2 The thickness of the films covered by this standard is 100 µm or less.

2 TERMINOLOGY

For the purpose of this standard the following definition shall apply:

Gel, a nodule of plastics material which is present in the matrix of film and is of such a composition that it is not readily blended with the matrix. Gels are believed to be composed of oxidized or high molecular weight materials, or both. A gel is to be distinguished from contamination such as particles of dirt, carbon, or lint.

3 APPARATUS

3.1 Overhead Projector

With a viewing plate at least 200 mm × 200 mm in size.

3.1.1 A rectangle 190 mm × 200 mm shall be drawn on the viewing plate of the projector.

3.2 Projection Screen

At least 2 m × 2 m in size.

3.3 Acrylic Plate

Approximately 230 mm × 230 mm × 3.2 mm thick containing two standard holes, one of which is 0.080 mm in diameter and the other is 0.40 mm in diameter. The holes shall be approximately 1 mm deep and shall have smooth edges. They shall be approximately 12 mm apart, and roughly centred on the acrylic plate.

4 TEST SPECIMENS

4.1 A test specimen consists of four layers of film which are at least 200 mm × 200 mm. A convenient size is 254 mm × 254 mm. It is also convenient to staple the four layers together at one corner.

4.2 Three test specimens shall be prepared for testing.

4.3 An area 190 mm × 200 mm is viewed through four layers of film, which gives a total film test area of 1520 cm^2.

5 PREPARATION OF APPARATUS

Set up the projector and screen so that a magnification of between 8 to 1 and 10 to 1 is obtained. Care shall be taken in projection not to distort the image on the screen. To prevent distortion, the line of projection from the mirror to the screen shall be perpendicular to the screen.

6 PROCEDURE

6.1 Place two blown tubing specimens or four flat film specimens, four layers of film in each case, on top of each other on the viewing plate of the projector, so that the lines on the viewing plate include the centre position of each specimen.

6.2 Place the transparent plastic plate with standard holes in contact with the film on the stack of specimens and press firmly to remove wrinkles as far as possible. Do not allow the staple holding film layers together to come between plates.

6.3 Focus the projector so that the gel images and the image of the gel size standards are clearly projected on the screen.

6.4 Count the gels within the rectangle that are as large or are larger than the 0.80 mm (larger) standard, and also the gels that are smaller than the 0.80 mm standard, but as large as or larger than the 0.40 mm (smaller) standard.

NOTE — The rectangle may be subdivided into smaller increments and gels counted in each small rectangle and then totaled for the report.

6.5 Record the number of gels equal to or larger than the 0.80 mm standard as 0.80 mm gels and those smaller than the 0.80 mm standard but as large or larger than the 0.40 mm standard as 0.40 mm gels.

6.6 Repeat with a second and third stack of specimens.

7 CALCULATION

Determine average and range of each size gel for each set of three specimens.

8 TEST REPORT

The test report shall include the following information:

a) The average and range of 0.80 mm gels per 1 520 cm^2,

b) The average and range of 0.40 mm gels per 1 520 cm^2,

c) Complete identification of the materials tested,

d) Date of test,

e) Number of specimens, and

f) Nominal film thickness.

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